Operating Instructions

Wireless Transmitter

PERROT

Perrot REGNERBAU CALW GmbH Industriestraße 19-27 / D-75382 Althengstett / Germany
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1 Safety

These operation and safety instructions include basic remarks and hints for the assembly, installation, operation, maintenance, inspection and repair. For this reason these instructions must be read by the fitter, as well as by the customers authorised staff, prior to the installation and commissioning.

Apart from the general safety instructions of this paragraph the special safety instructions include in other paragraphs of these operating instructions have to be observed also.

1.1 Symbols of hints given in these operating instructions

The non-observance of the safety instructions mentioned in these operating instructions can endanger persons, are

marked with the general danger symbol especially.

Safety instructions which can endanger the sprinkler and it's function, if not observed, are specially marked and the word **ATTENTION** has been inserted.

1.2 Dangers if the safety instructions are not observed

Non-observance of the safety instructions can endanger persons as well as the environment and the machine. Non-observance of the safety instructions can result in a loss of all claims for indemnity.

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2 Description

2.1 Control system components

2.1.1 Wireless Base Unit WBU (ZK28 93 684)

Radio receiver for the wireless transmitter and interface for PERROT Greenkeeper. Without mounting parts like antenna, cable, etc.

Green LED
On solidly:
Status OK
Power connected and on

Yellow LED
Flashing:
Whenever data is being sent or received.

Casing cover

Casing

RS232 connection for PC

RS232 connection for VCU

Terminal for power supply

Male connector for antenna

Power supply:

Charging voltage: 9VDC
Charge current: < 45mA stand-by
< 700mA with 1.3mm data transfer

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2.1.2 Wireless Transmitter WT (ZK28 93682)

License free, wireless hand set for the communication with the central control unit via radio. Primarily used for activating irrigation programs and valve stations.

Technical data:

ATTENTION

Specified batteries:

3 x NiMH 1.2V 1500mAh, rechargeable

Charge current:

- Voltage: 9VDC (8.5 – 10VDC)
- Charge current: < 45mA stand-by
  < 400mA when charging
- Plug: DC ∅ 3.8mm; centre pin 1.3mm

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Environment:

- Operating temperature: 0 – 55°C
- Waterproofing: IP54 (splash-proof)

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- Batteries must be put into the unit before the charger is connected.
- When inserting batteries pay attention to the pole markings inside the battery compartment.
- After putting in new batteries charging time is min. 8 hours.

2.1.3 Wireless Repeater Unit WRU (ZK28 93 683)

Repeater unit necessary in case of insufficient radio reception of the base unit.
With one or more repeater units the coverage can be extended.

Green LED
On solidly:
Status OK; connected with WBU (base unit) OK
On long – Off short:
Status OK; connected to another WRU (repeater unit)
Off long – On short:
Status OK, but not connected to a WRU or WBU
Off solidly:
No power supply or a hardware problem
(After power is supplied both LEDs glow until the repeater unit (WRU) has established a connection to another WRU or to the base unit.)

Yellow LED
Flashing:
Data transfer in progress
Off:
No data transfer in progress

Inlet for antenna cable

Cable inlet for power supply

Power can be supplied to the WRU via a power supply unit (see 2.2.1) or decoder line adapter (2.2.2), as preferred.

Power supply:

Charging voltage: 12VDC (8.5 – 15VDC)
Charge current: < 45mA
< 700mA during data transfer

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2.2 Power supply accessories

2.2.1 Power Supply Unit (ZK28 93 685)

Power supply unit for charging the wireless transmitter and for power supply of base and repeater unit. Automatic input voltage 100 – 240 V as well as switchable output voltage.

The power supply unit is fitted at the factory with a connector plug for the transmitter

If the power supply unit is to be used for supplying power to the WBU or WRU, you need to cut off the connector plug and strip the insulation off of the ends of the cable. You then clamp the wires in the terminal strip of the WRU or WBU.

Charging voltage / power supply settings:

WBU: 9VDC
Transmitter: 9VDC
WRU: 12VDC

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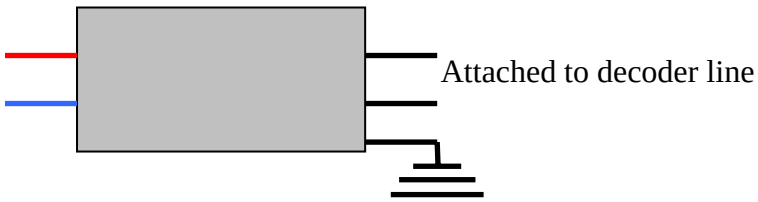
2.2.2 Decoder Line Adapter (ZK28 93 676)

Power can be produced by the decoder line adapter from the decoder cable if no power supply is available at the repeater unit.

Verdrahtungsschema:



ATTENTION

Earthing is essential to provide protection from overvoltage!

Input voltage:	18VAC – 48VAC (as available on the decoder line)
Input current:	< 60 mA in stand-by mode
	< 350 mA max. load
Output voltage:	12VDC
Output current:	< 100 mA
Operating temperature:	- 20°C – 60°C
Waterproofing:	IP68 (watertight)

2.3 Antenna and antenna connection accessories

2.3.1 Antenna (ZK28 93 681)

Saltwater-proof antenna with 7,15 dBi amplification for a frequency range of 868 MHz. Antenna is used for the base and the repeater unit

2.3.2 Cable for Antenna (CBO2 50 063)

Cable to connect the base repeater unit with the antenna. Desired length is assembled with necessary plugs on customer request.

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When planning the installation of the WBU or WRU, you should ensure that the antenna cable is kept as short as possible. This minimises any losses and improves reception strength.

2.4 Data cable

2.4.1 Interface Cable (ZK28 94 270)

Interface cable to connect the base unit with the PC.
The length must not exceed 10 metres.

2.5 Accessories for setting up the antennas

2.5.1 Mounting Angle Set (ZK28 93 678)

Mounting angle for simple fixation of the antenna on walls.

2.5.2 Wall Holder (CBB2 50 050)

Rugged wall holder necessary for the fixation of cantilever for the radio mast.

2.5.3 Cantilever (CBB2 50 060)

Cantilever with mounting clamps for antenna mast consistent with wall holder.
Individually customizable length.

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2.5.4 Bottom Attachment (CBB2 50 058)

For the assembly of free-standing antennas. Bottom attachment is stabilized by a flush to floor installation and the load of concrete slabs.

2.5.5 Radio Mast (CTD1 50 057)

Pipe with 50 mm diameter and 3m length as radio mast applicable with wall holder and bottom attachment.

2.5.6 Pipe Connector (CBB2 50 044)

Pipe connector for the installation of additional radio masts.

2.5.7 Skid (CTI1 50 042)

Skid to fix the nylon rope if radio mast has to be anchored for stabilization.

2.5.8 Nylon Rope (CTO7 50 064)

27,5m nylon rope in 4 mm to anchor free-standing radio masts.

2.5.9 Mast cap (CBB2 50 041)

Mast cap necessary for the fixation of the antenna on the radio mast.

2.5.10 Connecting Nut for Mast Cap (ZK28 93 679)

For clamping antenna on the mast cap.

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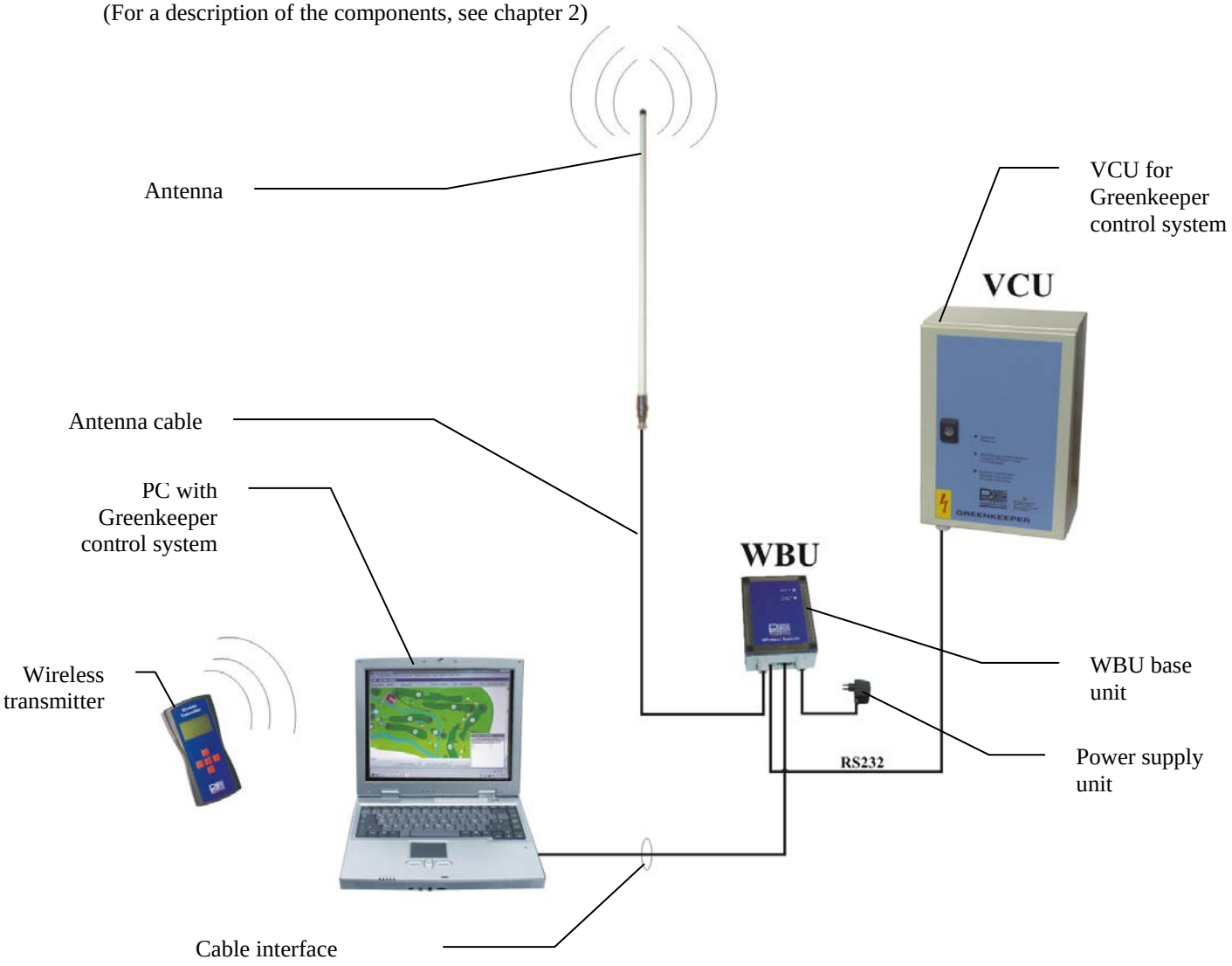
3 Installation

3.1 Integration of the WBU into the Greenkeeper control system

Installation and wiring diagram
(For a description of the components, see chapter 2)



In selecting the installation site and cable routes the following criteria should be considered:

- ☆ The antenna should be installed in such a way that there is the best possible line of sight to the area from which the transmitter is due to be operated.
- ☆ The cable path to the WBU should be as short as possible. The antenna cable should certainly not be longer than 20 metres (see also 2.3.2).

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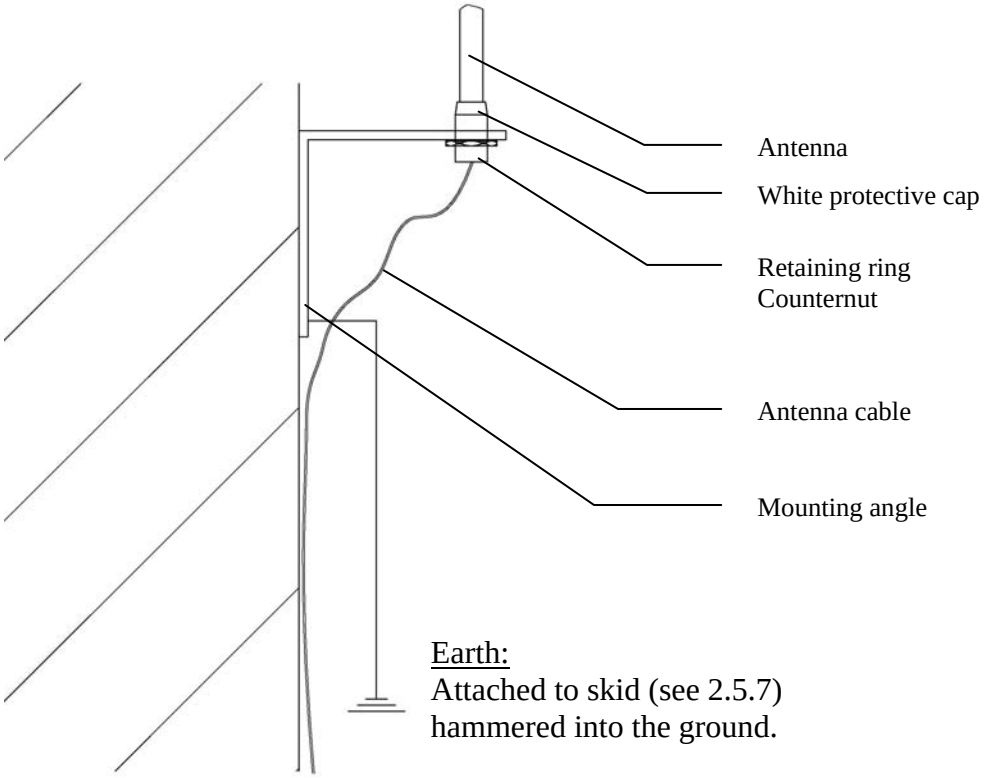
3.2 Installing the antenna

After deciding on the antenna installation site, it makes sense to install the antenna first. The antenna must be fixed in place firmly and securely. Whether the antenna is be fixed to a wall or on the ground, Regnerbau Calw GmbH can provide the requisite accessories (see 2.5). Three possible installation variants are described below.

Variant 1
Installing the antenna using the mounting angle set (see 2.5.1) included in the standard package:

- ☆ Fix mounting angle to a wall
- ☆ Push white protective cap onto the bottom end of the antenna and then guide the antenna, complete with protective cap, through the mounting angle
- ☆ Using the counter nut and retaining ring, screw the antenna (see 2.3.1) with protective cap to the mounting angle
- ☆ Connect the antenna cable (see 2.3.2)
- ☆ Lay the antenna cable inside a protective tube all the way to the base unit (2.1.1) or repeater unit (2.1.3). Maximum cable run: 20 metres.
- ☆ Using silicon, additionally seal off the connections to stop any water getting in
- ☆ Installation of earthing:
  Connect the mounting angle to the skid (see 2.5.7), which has to be hammered into the ground, by a copper cable with a min. Size of 16mm². As option if is possible to connect to the grounding system of the building.



All of the parts, except the antenna cable, are included in the mounting angle set.

ATTENTION ***Earthing is essential to provide protection from overvoltage!***

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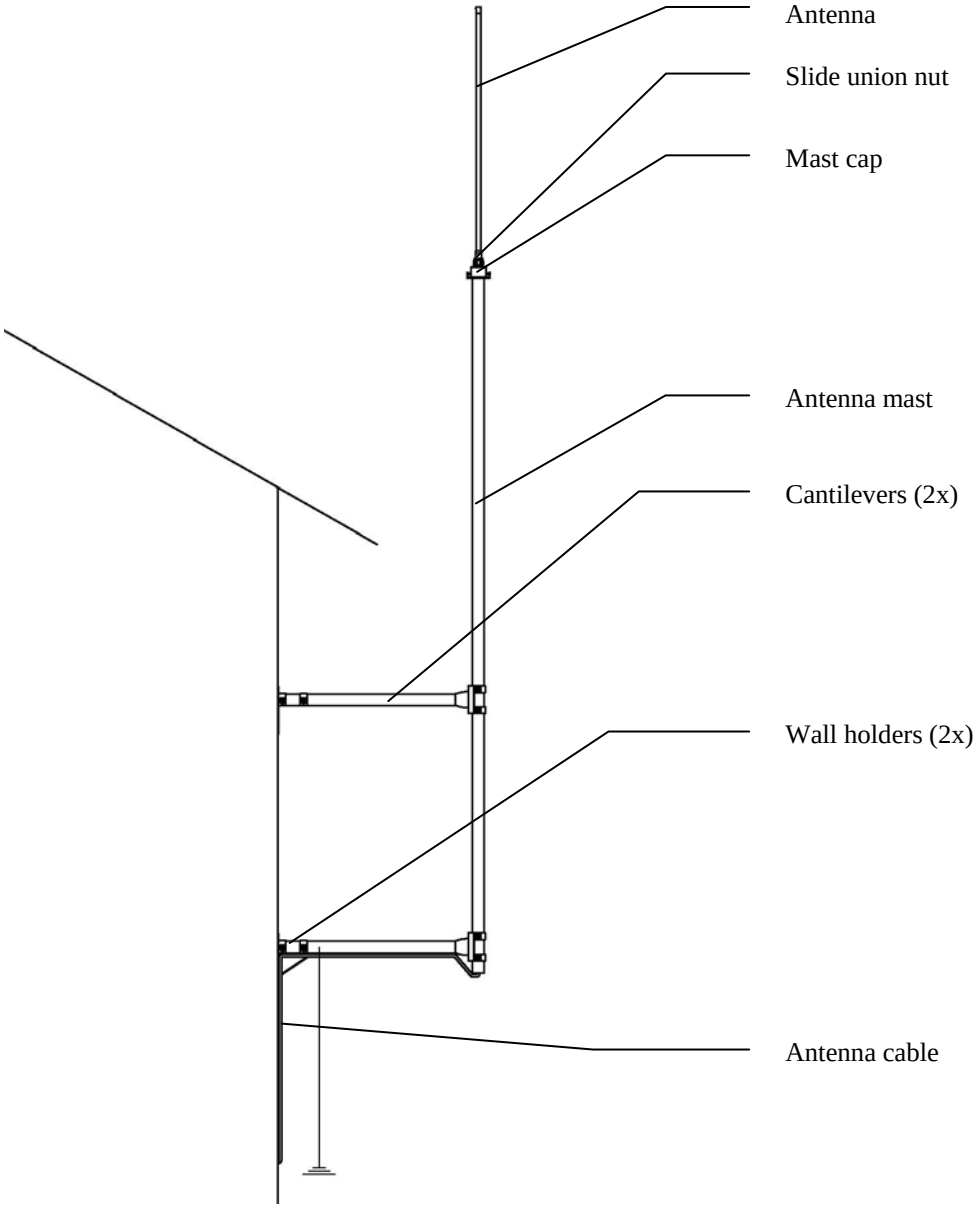
Variant 2

Installing the antenna using wall holder and cantilever:

- ☆ Secure wall holder (see 2.5.2) to the wall
- ☆ As appropriate to the projection of the roof, fit cantilever (2.5.3) to the wall holder
- ☆ Push mast cap (2.5.9) onto the antenna mast (2.5.5) and clamp tight using the 3 screws
- ☆ Thread the antenna cable (2.3.2) through the antenna mast and connect it to the antenna
- ☆ Push O-ring onto antenna (2.3.1)
- ☆ Push antenna into mast cap and screw together using slide union nut (2.5.10)
- ☆ Using the fastening clips, screw the pre-assembled antenna mast firmly to the cantilever
- ☆ Lay the antenna cable inside a protective tube all the way to the base or repeater unit (max. cable run: 20 metres)



Establish grounding system according item 3.2 – variant 1

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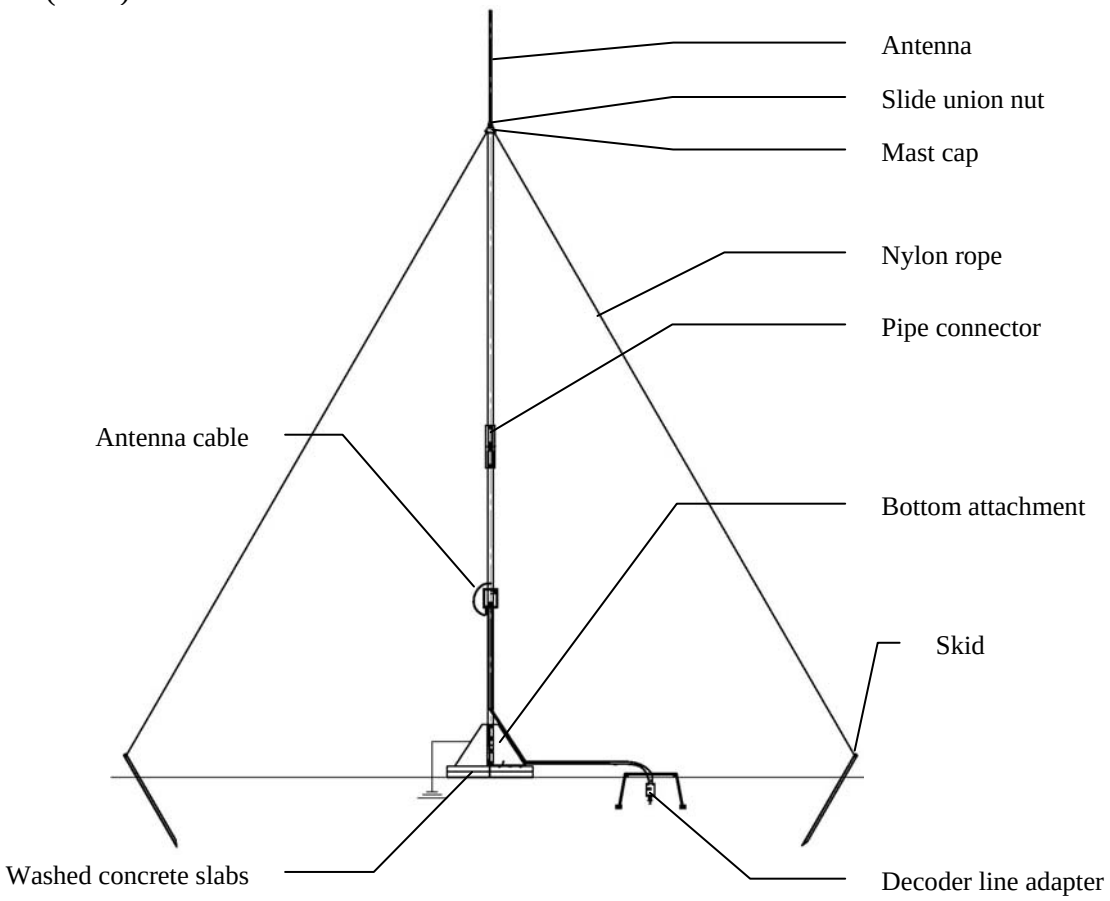
Variant 3

Installing a free-standing antenna: zinc spray

- ☆ Prepare base slab for the bottom attachment. The base slab can consist of a concrete slab or of compacted gravel with wet mix aggregate
- ☆ Set up bottom attachment vertically on base slab and weigh down with washed concrete slabs.
- ☆ Connect both antenna masts (2.5.5) to the pipe connector (2.5.6)
- ☆ Push mast cap (2.5.9) onto the antenna mast and clamp tight using the 3 screws
- ☆ Thread the antenna cable (2.3.2) through the antenna mast and connect it to the antenna (2.3.1)
- ☆ Put O-ring on antenna
- ☆ Push antenna into mast cap (2.5.9) and screw together using slide union nut (2.5.10)
- ☆ Cut the nylon rope (2.5.8) into three parts of equal length
- ☆ Tie the three nylon lines tightly to the mast cap
- ☆ Erect antenna mast and secure to the bottom attachment (2.5.4)
- ☆ Decide on position for the 3 skids (2.5.7) and hammer into the ground
- ☆ Connect nylon lines to the skids, align the antenna mast and anchor using the nylon lines
- ☆ Lay the antenna cable inside a protective tube all the way to the base or repeater unit (2.1.3). Max. cable run: 20 metres.



Establish grounding system according item 3.2 – variant 1

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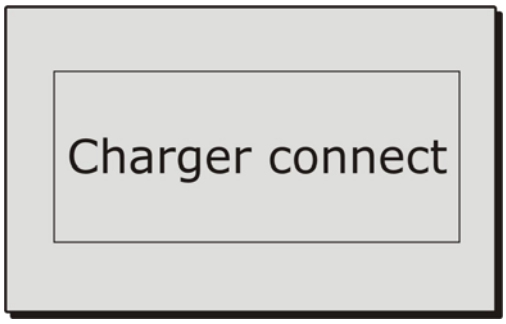
3.3 Installing the base unit (WBU)

- ☆ Unscrew and take off the WBU's casing cover
- ☆ Fix WBU to the wall, following the instructions listed at 3.1
- ☆ Draw antenna cable through the left cable connector screw fastener and screw onto the antenna socket
- ☆ On the power supply unit, pinch off plug connector at the cable and strip off insulation
- ☆ Draw cable through the right cable connector screw fastener and firmly screw the stripped cable ends in the power connection terminal. (Polarity as selected)
- ☆ **Set voltage at power supply unit to 9V**
- ☆ Screw base unit casing cover back on
- ☆ Connect RS232 interface cable with VCU and PC as per sketch (see 3.1)
- ☆ Establish power supply

3.4 Using the wireless transmitter (WT) for the first time

- ☆ Open battery compartment cover
- ☆ Insert battery
- ☆ Close cover
- ☆ Select appropriate plug for the charger from the set and connect to the power supply unit
- ☆ The charger must be set to 9V
- ☆ Plug in charger

ATTENTION Connect wireless transmitter to charger.
The display should now show 'Charger Connect'.



3.5 Checking whether a repeater unit is needed

3.5.1 Determine area with wireless connection

After the WBU has been installed and the WT is ready for use, you can test out the area with wireless coverage.

↳ **Note:**
Depending on terrain / location, you can assume a range of c. 800-1500 metres. However, if the reach is not adequate, you can double it using the wireless repeater unit (WRU)

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Reach is determined by going to the 'Transceiver Test' menu (see 5.5.5) on the WT and pacing out the desired area.

ATTENTION If the WT is moved quickly, e.g. in a moving vehicle, the wireless connection may get interrupted.

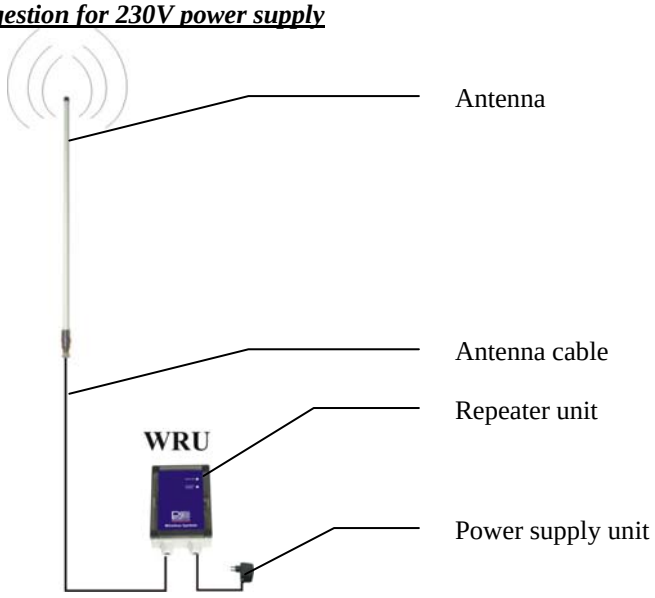
With a good connection the test will show hardly any errors.
An error ratio of <5% can be tolerated. If the error ratio starts to rise, you are outside of coverage range. If you want to cover this area with the wireless connection, a repeater unit must therefore be installed.
In selecting a suitable site for the repeater unit (WRU), you must bear in mind the following:

- The WRU must be set up within the area where the wireless connection to the base unit is still stable.
- A building for fixing the antenna makes setting up the unit easier
- A 220V power supply or decoder cable must be available (220V supply is preferable).

3.5.2 Installing the wireless repeater unit (WRU)

- At selected site set up antenna as per suggestions at 3.2
- Unscrew and take off the repeater unit's casing cover.
- Fix repeater unit to the wall.
- Draw antenna cable through the left cable connector screw fastener and screw onto the antenna socket
- **IMPORTANT: Antenna cable must not be longer than 20 metres.**
- On the power supply unit, pinch off plug connector at the cable and strip off insulation
- Draw cable through the right cable connector screw fastener and screw the stripped cable ends tightly into the power connection terminal.
- **Set voltage at power supply unit to 12V**
- Screw repeater unit casing cover back on
- Establish power supply

Set-up suggestion for 230V power supply



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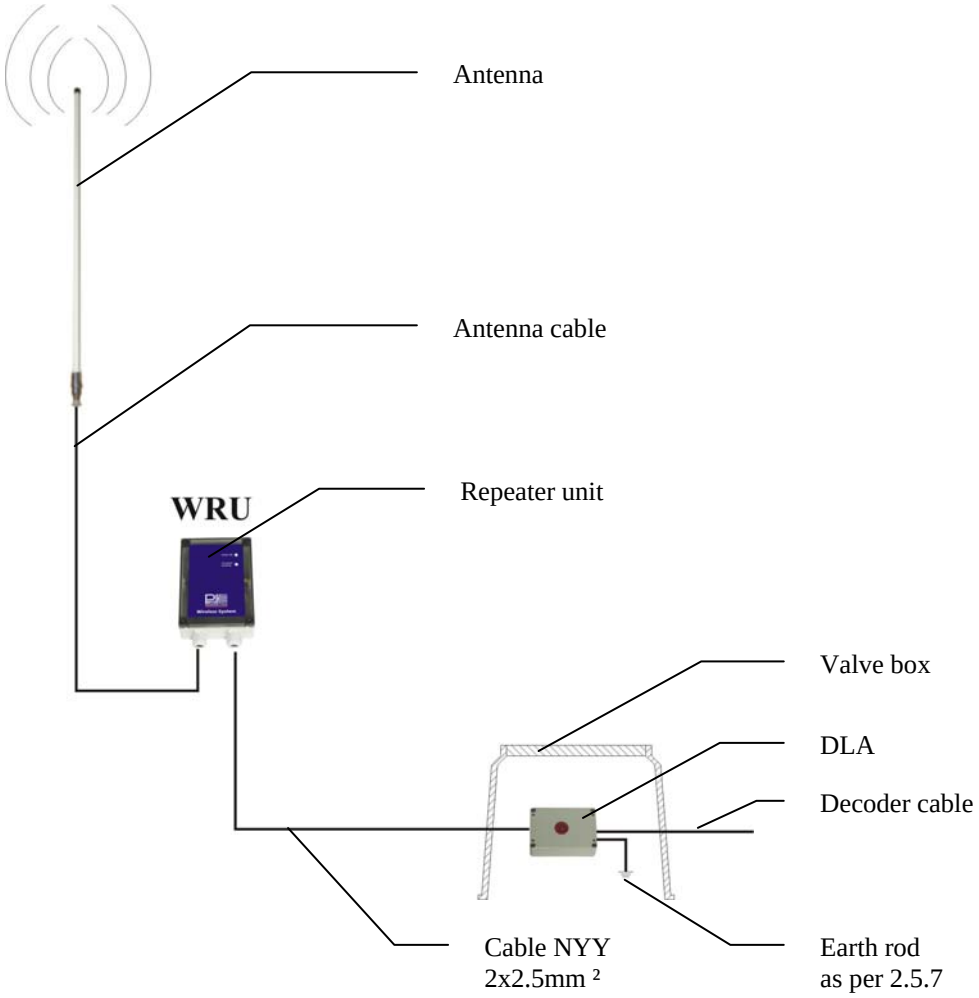
Set-up suggestion for power supply using a decoder line adapter (DLA)



- At selected site set up antenna as per suggestions at 3.2
- Unscrew and take off the repeater unit's casing cover.
- Fix repeater unit to the wall.
- Draw antenna cable through the left cable connector screw fastener and screw onto the antenna socket
- **IMPORTANT: Antenna cable must not be longer than 20 metres.**
- Connect DLA as per wiring diagram at 2.2.2 to WRU and decoder cable

ATTENTION Whenever wiring work is being done the decoder cable must disconnected from the power supply.

ATTENTION Cables must be connected using watertight connectors.

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ATTENTION For optimum overvoltage protection the green - yellow cable from the DLA must be earthed using the earth rod.

- Screw shut WRU's casing cover
- Switch power supply back on
- Check WRU is working properly as described at 2.1.3

4 Transfering data to the base unit

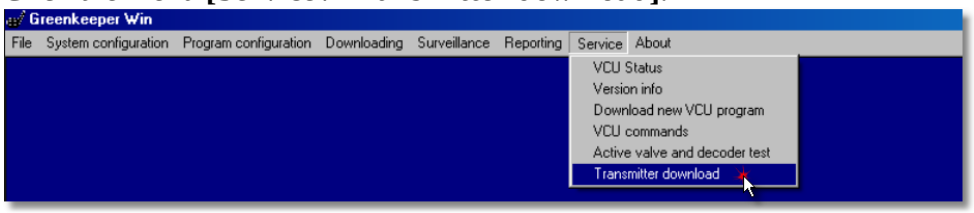
4.1 Transfer system data to base unit

Before the WT can be used, the system data and associated decoder numbers have to be transferred to the base unit.
This is generally done during installation and it is therefore usually **not** necessary to transfer the data again.

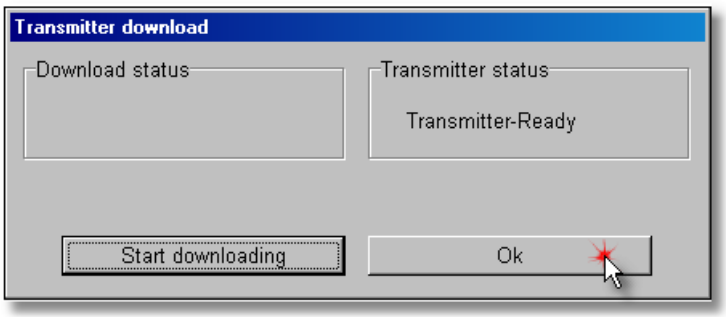
However, if any valve names have changed, been deleted or added, then the data does need to be transferred again.

Data transfer to base unit
For this to be done the base unit has to be connected to the PC and VCU.
Start the Greenkeeper software and enter the password for **Level 3**.

Click the menu **[Service / Transmitter download].**



Click **Start downloading**
The data is then transferred to the base unit.
When the transfer has been successfully completed, click **OK**.



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ATTENTION **Greenkeeper Win version 2.03c** or later is required. The wireless transmitter does not work with older versions.

ATTENTION Even if the wireless transmitter is installed, the wired transmitter can still be used. For data transfer, however, the VCU must be connected back directly to the PC, i.e. the base unit in between has to be unplugged.

If any programme data changes, the system data must be reloaded onto the base unit.

4.2 Transfer valve data to wireless transmitter

After the system data has been transferred to the WBU, the next step requires the data from the WBU to be loaded onto the WT. This is done as described at 5.5.1.

NOTE The valve numbers are listed alphabetically or by decoder number. This enables you to define the sequence in the WT when issuing valve names (Note: G01 not G1).

4.3 Transfer programme data to wireless transmitter

As the WT can also be used to start watering programmes, the programme data must also be transferred from the WBU to the WT. This is done in a separate step, which is described at 5.5.2.

ATTENTION The transfer of programme data to the WT only has to be done again if any watering programmes on the VCU are added or deleted. To do so, repeat 4.1 and 4.3.

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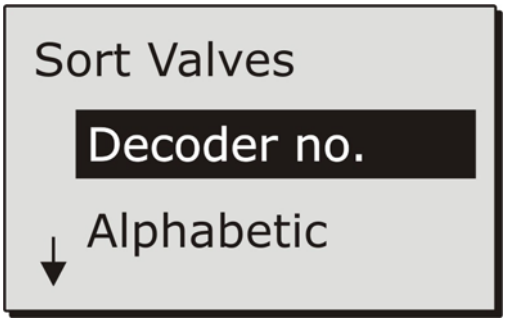
5 The wireless transmitter menu structure

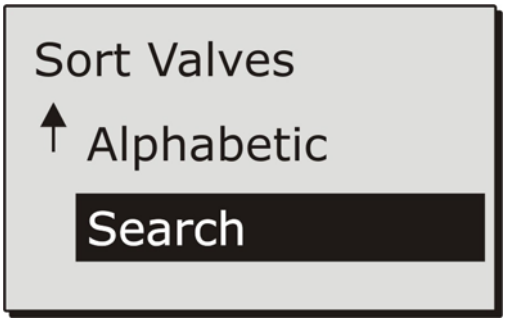
Menu	***Description***
Valve list	List of all valves/units that can be individually opened/closed
Programme list	List of all watering programmes that can be started
Watering status	Displays the watering status
Emergency stop	Enables all valves/programmes that have been started to be immediately stopped
Service menu	This is where updates of valve/prog. data are done. The menu is also used for determining reach and displaying version details and faults.

5.1 Start / stop valves

☆ Using the arrow keys select 'Valve list' menu

Press to confirm





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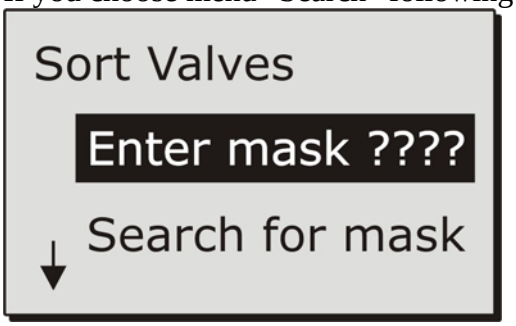
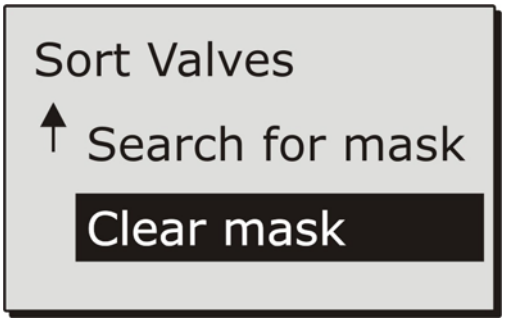
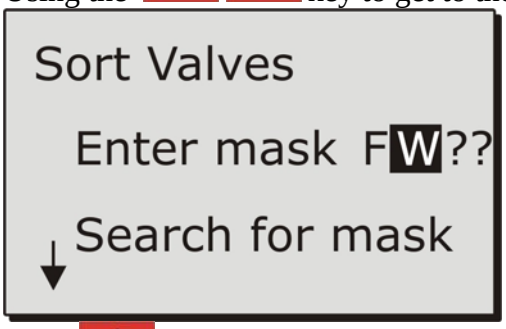
1. If you choose menu “Decoder no” the valve names are listed afferent according the decoder number
2. If you choose menu “Alphabetic” the vale names are listed alphabetically
3. If you choose menu “Search” following menu will apprear:





The user can replace the “?” for a given character.

Using the key to get to the search mask.



Press to confirm.

The display will show only the valve names starting with “FW”

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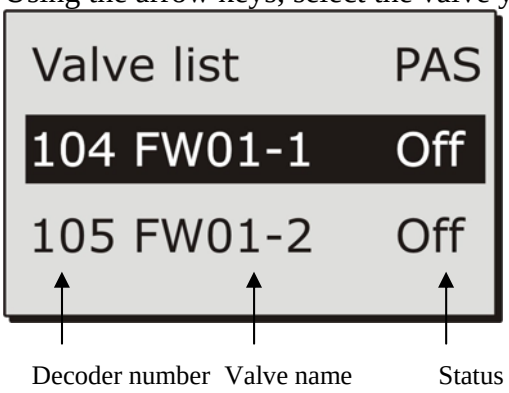
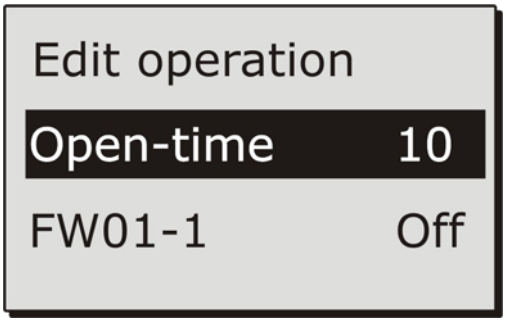
☆ Using the arrow keys, select the valve you want



System watering status:

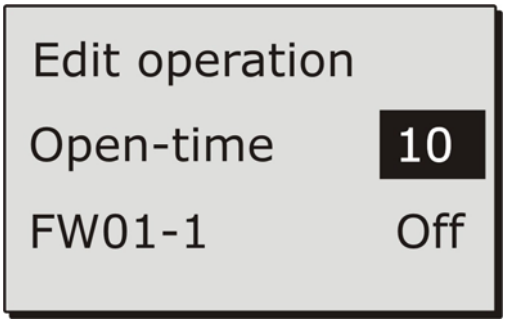
PAS:	Passive	AUT:	Waiting for programme start
RUN:	Watering running	ERR:	Error

☆ Press to confirm



☆ Using arrow key, select time open and valve

☆ Press to confirm –> (Time open) using arrow keys
Increase/reduce time open



☆ Press to confirm

☆ Using arrow keys select valve

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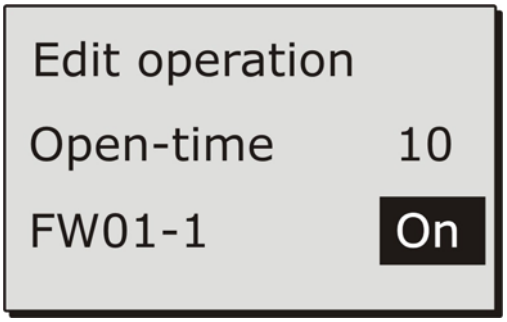
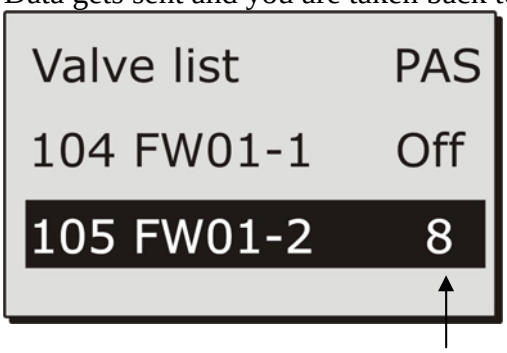
☆ Press to confirm

☆ Press to confirm



☆ Press to confirm

☆ Data gets sent and you are taken back to the valve list



Valve run time

☆ Close valve again manually, repeat every step and select 'OFF'

☆ Using exit valve list

5.2 Start / stop watering programmes

☆ Using arrow key, select programme list

☆ Press to confirm

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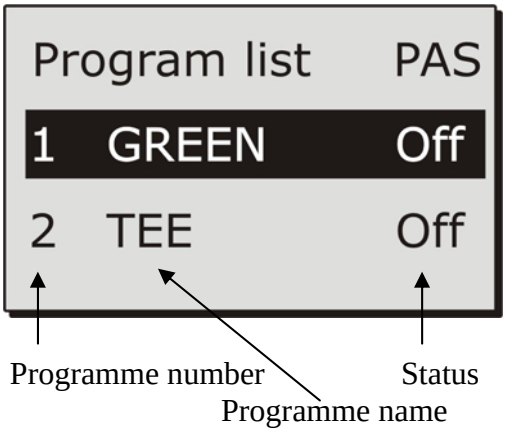

Watering programmes can only be started when in PAS status!

System watering status:

PAS: Passive
RUN: Watering running
AUT: Waiting for programme start
ERR: Error

☆ Arrow keys ON

☆ Press to confirm

☆ And again

☆ Arrow keys ON

☆ Press to confirm

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☆ Data gets sent and you are taken back to the programme list

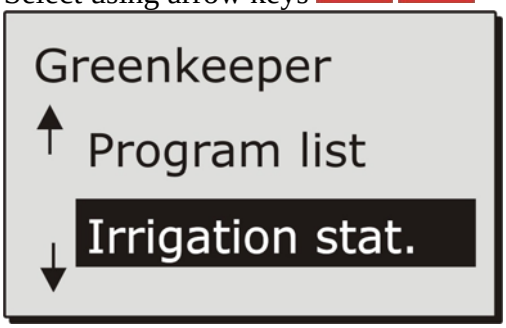
Data gets sent and you are taken back to the programme list

Run time

☆ If you want to stop the irrigation program, repeat all steps and select 'OFF'

5.3 Query watering status

☆ Select using arrow keys



☆ Press to confirm

The irrigation status can be as follows:

Inactive:	Irrigation off
Start Pending:	Irrigation is waiting for programme start
Active Auto:	Irrigation programme is running
Stop Auto:	Irrigation was stopped manually
Weather:	Irrigation was stopped by the weather station
Active Manuel:	Irrigation was started manually
Stop Manuel:	Irrigation was stopped manually
VCU error:	Fault in the control system

☆ Using exit the menu

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5.4 Emergency stop

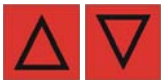
☆ Using arrow keys select ‘Emergency stop’

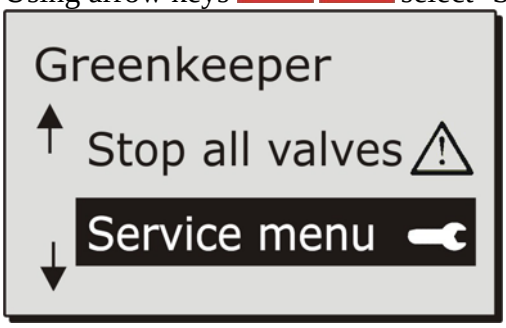
☆ Press to confirm

☆ Confirm by pressing

☆ Data gets sent and you are taken back to the main menu

5.5 Service menu

☆ Using arrow keys  select ‘Service’ menu



Press to confirm

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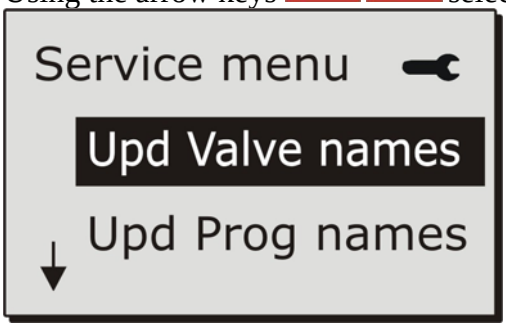
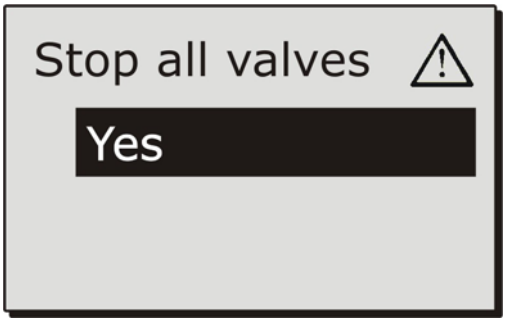
5.5.1 Update valve data

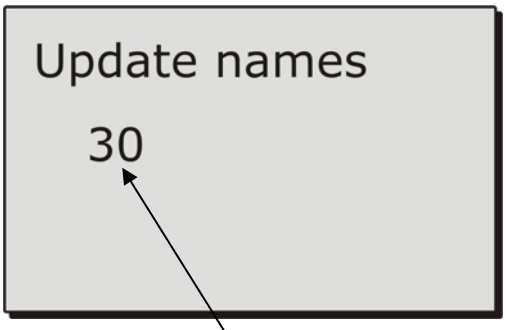
☆ Using the arrow keys select ‘Update valve number’



☆ Press to confirm



☆ Press to confirm



Counts upwards until message appears

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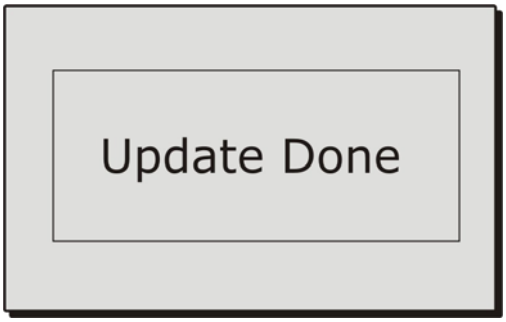
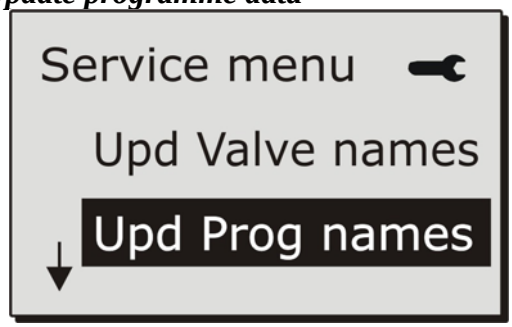


Press to confirm

☆ Returns to main menu

5.5.2 Update programme data



☆ Proceed as at 5.5.1

5.5.3 Set WBU address

☆ Has no function for GK control system. Is a placeholder for P.S. control system.

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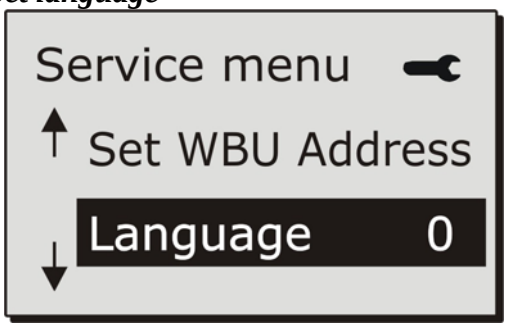
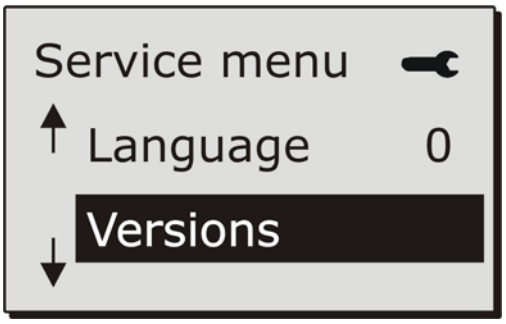
5.5.4 Set language



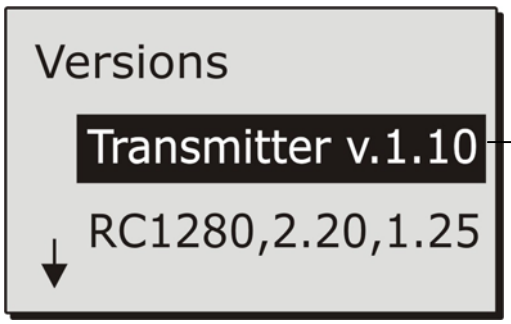
Set language:
0: English
1: French
2: Dutch
3: Czech
4: German

☆ Press to confirm

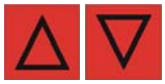
5.5.5 Version



☆ Press to confirm



TM software version number

☆ Scroll using arrow keys 

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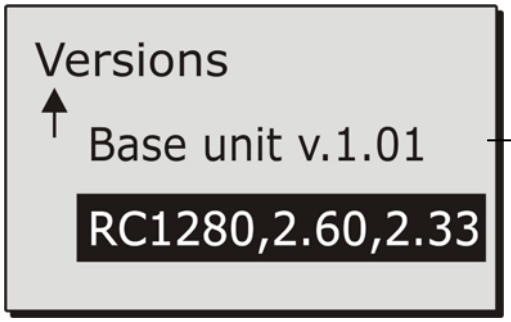


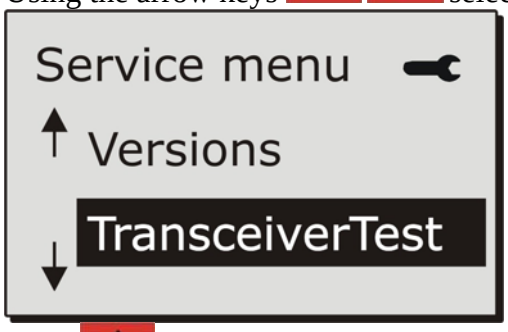
WBU software version number

☆ Press ESC to go back

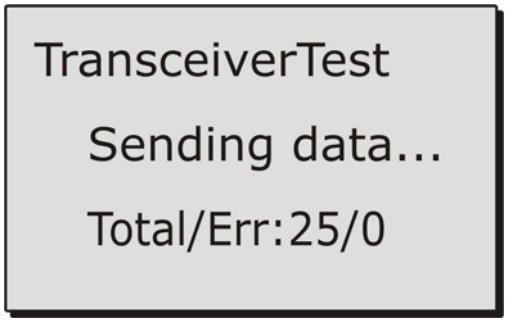
5.5.6 Transceiver test

Is used to determine the reach from the WBU to the WRU.

☆ Using the arrow keys △ ▽ select 'Transceiver test'



☆ Press OK to confirm



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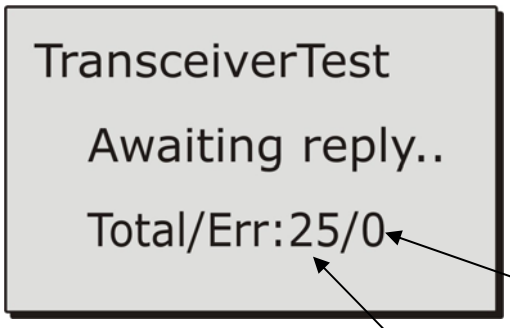
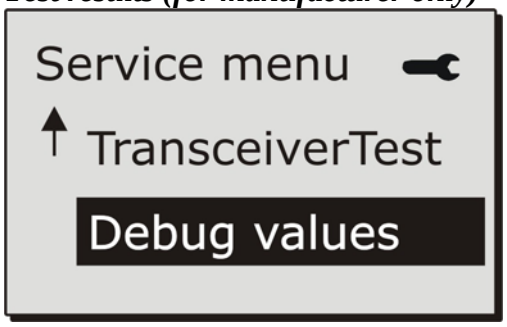


If connection is lost / if outside of reach area, errors go up.

Shows signals sent / received within the reach area

☆ Is ended by pressing ESC

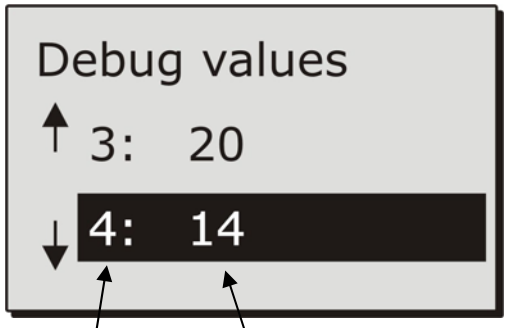
5.5.7 Test results (for manufacturer only)



Is used to analyse faults.

☆ Select using arrow keys △ ▽

☆ Press OK to confirm



Error no. Error code index for analysis

☆ Pressing ESC closes the menu

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6 Troubleshooting

WT cannot be operated or is getting no reception

⇨ To reset press the

key and hold it down for 5 seconds.

Defects	***Reasons***	***Elimination***
Data transfer not working	Software has hung	Press reset key for 5 seconds
Cannot change menu on WT	Software has hung	Press reset key for 5 seconds
Battery will not charge	- Batteries are faulty - Batteries' +/- poles are wrong way round - Charger's plug wrong way round - Wrong power setting on charger	- Renew - Insert batteries correctly - Reverse plug polarity - Set power to 9V
Data cannot be transferred to the WBU	Old Greenkeeper version – version 2.03c or above is required	

Subject to change without prior notice.

We remain at your full disposal for any further information you may require!

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